AYUSH SINHA

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EDUCATION

Columbia University — New York, NY
MS in Data Science, GPA: 3.82/4.0 — Sep 2021 - Dec 2022
Coursework: Probability, Statistical Inference, Algorithms, Deep Learning, Machine Learning, Cloud Computing
TA: Algorithms (CS, Fall 2022)

Manipal Institute of Technology — Manipal, IN
BTech in Information Technology, Minor in Computational Math, GPA: 9.24/10.00 — Jun 2017 - Jul 2021
Coursework: Data Structures, Operating Systems, Databases, Embedded Systems, Distributed Systems, Computer Networks

SKILLS

- Languages/Libraries: Python, PySpark, SQL, C++, Matplotlib, NumPy
- Framework/Tools: Azure Databricks, Sklearn, MLflow, AutoML, TensorFlow, Keras, Linux, Git, Docker

WORK EXPERIENCE

eClinicalWorks — Remote, NY
Data Scientist — May 2023 – Present
- Improving model performance by implementing experiments for the core product of the team and testing model serving in prod.
- Implemented **SHAP** for distributed Spark XGBoost Model and reduced the model's training time by > factor of 10
- Fine tuned **LLMs**, Mistral 7B and LLama models on Azure Databricks, utilizing **QLoRA, RAG** and prompt engineering

Columbia Experimental Gravity Group — New York, NY
Research Assistant — Jun 2022 – Mar 2023
- Developed the Low-Latency Algorithm for Multi-Messenger Astrophysics (LLAMA) search pipeline to receive and identify **real-time** astrophysical signals and deployed using **Docker**
- Implemented a new hop client listener to keep receiving real-time gravitational wave and neutrino signal through **Kafka data stream**, as well as parsing, storing, analyzing the real-time astrophysics event message and generating significance calculation files

Columbia Business School — New York, NY
Research Assistant — Jul 2022 - Aug 2022
- Extracted and analyzed S&P 500 companies' sustainability reports; Generated Sentence Embeddings using **ClimateBERT**
- Ranked relevant sentences utilizing cosine distance and ran array jobs on Columbia HPC for ~150 reports
- Fine-tuned ClimateBERT for sequence classification on imbalanced dataset using Hugging Face, reaching accuracy of 90%

Altair Engineering — Troy, Michigan
Deep Learning Intern — May 2022 - Aug 2022
- Reviewed custom implementation of Graphical U-Net to replace simulations; Introduced **OOP design** to components
- Designed Novel Optimized **pooling algorithm** and feature mapping operation in **GNN** achieving speedup factor of 96
- Experimented with **sparse inputs** to reduce memory consumption of Model below 250 GB while training

Dell Technologies — Bangalore, IN
Business Intelligence Intern — Feb 2021 - Jun 2021
- Extracted and Integrated data using SQL, Python and Excel; Did **hypothesis testing** to find features influencing customer surveys
- Utilized **logistic regression** and **Random forests** to determine customer as promoter or detractor with accuracy > 60%
- Analyzed ~30 features from model outputs to draw business interpretations and communicated findings to > 10 teams

PROJECTS

Radiology Report Generation (link) — Sep 2022 - Dec 2022
- Supported **Accenture AI team** in utilizing multimodal learning from Radiology Reports and Chest X-rays for report generation
- Compared the performance with SOTA and investigated model results through experimentation
- Created the inference pipeline of the model and replaced **ResNet** with **EffecientNet** observing 25% increase in BLEU score

Student Management Application — Sep 2022 - Dec 2022
- Developed a scalable full stack application to support **CRUD** operations, pagination, login authentication, notifications, etc
- Devised application frontend using Angular and deployed using **AWS** CloudFront; Conforming API to be RESTful
- Built **Microservices** using Flask and deployed using AWS EC2 and EB and deployed DB using AWS RDS

Spectral Representations for Convolutional Neural Networks (link) — Sep 2021 - Dec 2021
- Coded custom spectral pooling layer, spectral parametrization of filters and frequency dropout for **CNN** using TensorFlow
- Visualized information preservation during spectral pooing and convergence speed in spectral convolutions
- Achieved faster convergence of **CNN** during training with factor of 2.2-5.1 based on architecture and a competitive pooling method

Dell Technologies: Competitive Intelligence, WiCi Platform — Jun 2020 - Sep 2020
- Implemented **web crawlers** to automate aggregation of data from multiple competitor websites using Beautiful Soup and Selenium
- Transformed data for efficient use and built a classification pipeline for various news articles with accuracy > 90%
- Optimized web crawling using multithreading saving time by 80% and summarized news articles using **TextRank**